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CROP PRODUCTION NEWS

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PRODUCTION

Editor's Comments

By Sean Miller, PAg, Crops Branch

The focus on insects and crop diseases will continue throughout July. The Crop Protection Laboratory has been busy of late with samples of these pests, and other causes of crop damage. To have a sample analyzed in the Crop Protection Lab, go to the Saskatchewan Agriculture website at www.agriculture.gov.sk.ca/programs-services and scroll down to Crop Protection Laboratory Services.

The Pest Management Regulatory Agency has approved an emergency registration for aerial application of Centurion EC herbicide for the control of labelled weeds in canola, flax, field pea, dry bean, soybean, lentils, chickpea, potato, sunflower and mustard in Alberta, Saskatchewan and Manitoba. The emergency registration expires on October 31, 2010. Refer to the amended Centurion EC label for complete details.

REMEMBER TO FOLLOW PRE-HARVEST INTERVAL GUIDELINES WHEN APPLYING CROP PROTECTION PRODUCTS.

Pre-harvest intervals (PHIs) must be followed to ensure the maximum residue levels are not exceeded in the harvested crop. The PHI is the number of days that must pass between the last application of a pesticide and harvest. Harvest is defined as the cutting of the crop or the removal of the product from the plant. This includes direct-combining, cutting (swathing) or grazing; it does not include combining swaths or baling for hay. Refer to the crop protection product label or the product information in the *2010 Guide to Crop Protection* for more information on specific PHIs.

For an update on provincial crop progress throughout the growing season, see the weekly Crop Report at www.agriculture.gov.sk.ca/Crop-Report.

NOTE: Throughout this document, you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this on your computer screen, click your cursor on the link to take you directly to the website. ☺

CROP PRODUCTION

Crop Production News is a bi-weekly publication prepared primarily by provincial specialists with the Crops Branch and Regional Services Branch of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

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Crop Protection Laboratory Update

By Philip Northover, AAg, Supervisor, Crop Protection Laboratory

Recent submissions have been dominated by environmental damage and chemical injury in canola, lentils, peas and cereals. Over the past two weeks, the following diseases caused by pathogens have been diagnosed:

- Wheat: wheat streak mosaic virus, bacterial mosaic, bacterial leaf blight
- Barley: net blotch (spot form), loose smut
- Lentils: stemphylium blight, ascochyta blight, anthracnose
- Canola: blackleg, damping off
- Peas: mycosphaerella blight, ascochyta foot rot
- Strawberry: common leaf spot
- Camelina: white rust/downy mildew
- Caraway: botrytis blight

Over the past two weeks, the following weed samples have been identified: glaucous blue grass (*Poa glaucifolia*), scouring rush (*Equisetum hyemale*) and tufted vetch (*Vicia cracca*).

Of 27 potential Dutch elm disease submissions received this year, seven have now been confirmed.

Bacterial Mosaic of Wheat

Of all the diseases identified recently, bacterial mosaic of wheat caused by the bacterium (*Clavibacter michiganensis* subsp. *tessalarius* or Cmt) was most notable. This disease thrives under moist conditions. At this stage, it is uncertain what (if any) impact this could have on production: all that can be said is it has now been found in Saskatchewan. Relatively little is known about this disease, which is known to occur on wheat and triticale. It occurs sporadically in the central U.S. and Canada.

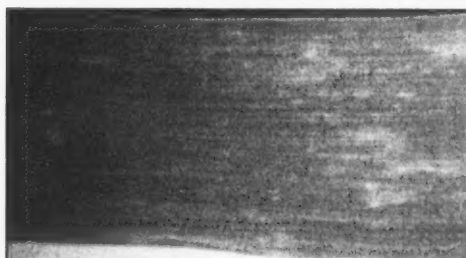


Figure 2: Flecking caused by bacterial mosaic
Source: Saskatchewan Agriculture

The symptoms – small yellow lesions (flecking) on leaves – are not easily distinguishable from a number of other disorders. Over time, these lesions may combine to form streaks on the leaves, which could be confused with wheat streak mosaic virus symptoms (which can also appear on leaves infected with Cmt). Unlike other bacterial diseases, no slime exudes from the leaves.

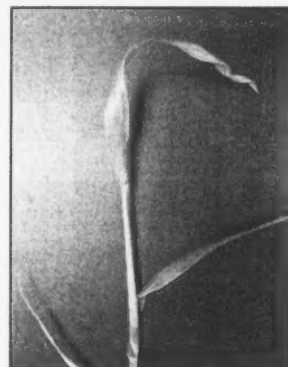


Figure 1: Leaf curl caused by wheat curl mite, associated with wheat streak mosaic virus
Source: Saskatchewan Agriculture

The bacterium can survive on host crop debris, and has the potential to colonize seed and glumes of the host. There are no known cultivars resistant to Cmt, but there do appear to be variations in susceptibility among wheat cultivars. ⚙

Agriculture Knowledge Centre Update

By Brent Flaten, PAg, Integrated Pest Management Specialist

The AKC continues to receive a large number of calls regarding the wet weather. Producers have been asking about timing and economic thresholds for applying fungicides on canola, cereals and pulses. In some cases, producers are trying to decide if they should be spraying fungicides on hailed crops. Producers and crop advisors are continuing to assess sickly, yellowing crops, trying to distinguish between leaf and root diseases, water stress or nutrient deficiencies. Many producers are asking about herbicide options to control advanced weeds on unseeded land that is finally drying out. Producers and custom applicators have been trying to spray herbicide between rain showers, and sometimes end up spraying in windier conditions than they normally would. In some cases this has resulted in spray drift complaints.

CBC radio and television did a report on health concerns related to giant hogweed, which created quite a stir. Many people mistook cow parsnip for giant hogweed. The latter hasn't been found in Saskatchewan. Cow parsnip is far less toxic. (See the article on page 4 in this CPN for more information.)

Insect inquiries have covered wheat midge, grasshoppers in lentils, and diamondback moth in canola and yellow mustard. Growers want to know what the economic thresholds are and what crop stages to watch, particularly when it comes to wheat midge. Some wheat midge spraying has taken place. Diamondback moth larvae have been showing up; generally in numbers less than the economic threshold.

Amongst the AKC calls related to plant disease issues, there have been some reports of smut on wheat and barley.

The AKC has handled soil-related questions on nitrogen and sulphur losses in wet soil conditions, topdressing nitrogen fertilizer for higher protein, green manure timing, and who is brokering carbon credits.

Flooded alfalfa is dying out in some areas. Concern continues that the rain, standing water and high humidity is slowing the cutting and baling of great-looking hay stands and reducing hay quality. Forage producers are also considering perennial forage termination. The AKC has received calls on hay preservative effectiveness and economics. ⚙

Giant Hogweed not yet in Saskatchewan

Clark Brenzil, PAg, Provincial Specialist, Weed Control

There has been some media attention paid to the discovery of giant hogweed (*Heracleum mantegazzianum*) in Ontario. This has led several people to contact the Ministry of Agriculture to report what they think is giant hogweed in Saskatchewan. Fortunately, these sightings are not of giant hogweed but of cow parsnip (*Heracleum maximum*). Cow parsnip is a native plant that is a close relative of giant hogweed, but does not pose the threat of severe contact dermatitis that giant hogweed does. Contact with the sap of giant hogweed and then exposure to sunlight can cause severe burning and blistering. Contact of the sap with eyes can result in temporary or permanent blindness.

Giant hogweed is a plant introduced from Europe, presumably by horticulturalists during the early part of the 20th century. As the name implies, giant hogweed is a mammoth plant that can reach heights of 15 feet, with leaves nearly three feet across. Both giant hogweed and cow parsnip are members of the carrot family that have characteristic umbrella shaped flowers called 'umbels'. Giant hogweed is considered an invasive plant and can spread throughout wild areas such as pastures, forests and riparian areas.

A good site to help people distinguish giant hogweed from other members of the carrot family is www.dec.ny.gov/animals/41009.html.

The chart on the next page compares some of the key features that distinguish cow parsnip from giant hogweed.



Figure 3: Cow parsnip
Source: Maxime Thiessen, Norquay, SK.

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Giant Hogweed not yet in Saskatchewan
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Table 1: Distinguishable features of cow parsnip and giant hogweed.

Feature	Cow parsnip	Giant hogweed
Height	Up to 8 to 10 feet high	Up to 10 to 15 feet high
Leaf width	Up to 1.5 feet across	Up to 3 feet across
Leaf shape	Lobed leaf with divisions to about half the distance to the main leaf veins. The leaf margins are slightly indented and can have relatively small teeth.	Lobed leaf with divisions about 7/8 of the distance to the main leaf veins. Leaf margins have large saw-toothed serrations.
Flowers	Flower umbels have from 18 to 30 basal flower rays (umbrella supports) on each flower.	Flower umbels have 50 or more basal rays (umbrella supports) on each flower.
Stems	Stems have fine fuzzy hairs that run along the stem and the stem is entirely light green.	Stems have stiff coarse white hairs and the stem surface has purple blotches or lines over a base of light green.

While there are no occurrences of giant hogweed in Saskatchewan, there are other members of the carrot family that can carry the risk of burns or poisoning. Wild parsnip is a relative of the vegetable parsnip and can cause burns similar to those of giant hogweed if skin is exposed to the sap. Wild parsnip is easily identified as it is a yellow-flowered plant with broad leaves which distinguish it from dill, which has fine, much-divided, lacy leaves. Wild parsnip can be found in the areas around Hague, Olser and Gruenthal north of Saskatoon and along #48 highway from roughly Davin to Montmartre.

Poison hemlock has been found in the Kipling area, and all parts of the plant are poisonous. Poison hemlock grows to about four feet in height and has white flowers. The distinguishing feature is purple blotches on the stem. Water hemlock can be found in many low-lying areas of Saskatchewan. The root bulb of this plant is highly poisonous, and other plant parts can also be poisonous if consumed by livestock. It also has white flowers and has twice-divided compound leaves that distinguish it from the non-poisonous water parsnip, which has once-divided compound leaves.

If you believe that you do have giant hogweed, carefully package a sample and send it to the Crop Protection Lab for official identification. All that would be required for a positive identification would be a flower umbel, one leaf and a portion of the stem with the purple markings. Please mark the outside of the box as "Caution: Possible Hogweed Sample may cause severe skin irritation". Attach the lab sample submission form in an envelope to the outside of the box. See www.agriculture.gov.sk.ca/programs-services (Scroll down to Crop Protection Laboratory Service) for more information on how to submit samples to the Crop Protection Lab. ⚙

Controlling Perennial Weeds in Fallow

Clark Brenzil, PAg, Provincial Specialist, Weed Control

With the increase in direct-seeding and continuous cropping, fallow is becoming increasingly rare in Saskatchewan. In 2010, there will be a significant number of unseeded acres that will require weed control. This article will provide useful tips on how to control perennial weeds in fallow.

Perennial weeds typically follow a pattern of growth that is often referred to as "The Perennial Cycle"

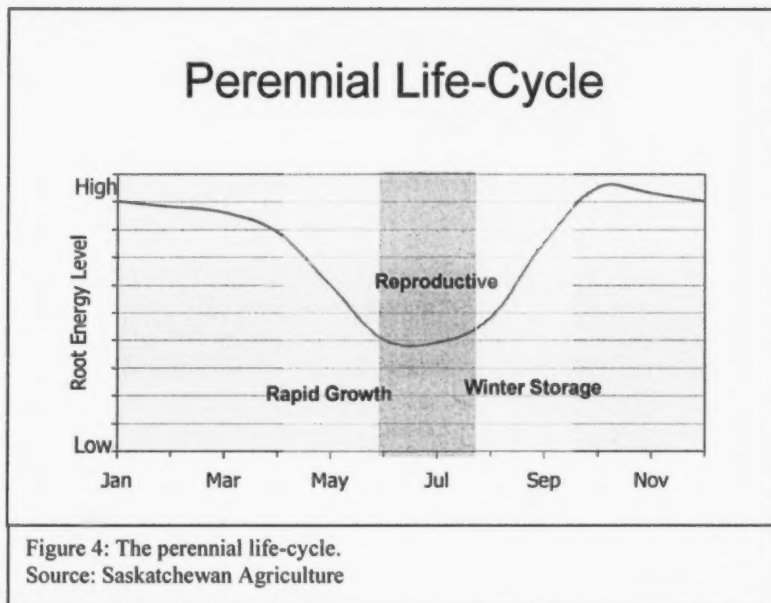
(Figure 4). The perennial cycle reflects the level of sugar or energy resource in the perennial storage organs (root, tuber, rhizome, etc.) and, therefore, the ability of the plant to regenerate itself from underground buds.

The general trend is that a perennial weed stores reserves to carry it through the winter. The plant then draws on those reserves to produce top-growth and energy for flowering and seed production. Once this task is complete, the flow of sugars in the plant changes from upward and out of the roots to downward and back into the roots, initiating the growth of new storage roots or other storage organs to complete the cycle.

Perennial weeds use both soil temperature and day-length as cues to follow the perennial cycle and every species has its own transition temperature. For example, most Canada thistle converts from reproductive to storage stages at about 15 to 15.5 hours of daylight. At day-lengths less than this, they form rosettes and produce new roots for the winter. Some perennial weeds, such as Canada thistle, follow the perennial cycle very closely; while other perennial weeds, such as field bindweed, can move sugars throughout root and shoot at the same time.

Producers can take advantage of the perennial cycle to enhance control of perennial species, but working against the perennial cycle can result in poor control and necessitate additional control measures. If systemic herbicide applications are made during a time when sugar movement is largely upward, the herbicide may not translocate to the dormant root buds and the perennial plant can regrow from those buds once it is no longer affected by the herbicide.

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Controlling Perennial Weeds in Fallow (Continued from page 6)

If applications are made when sugars are moving rootward, the efficiency of the application increases and the new roots are now the destination for the sugars and the systemic herbicide moving with them. In some cases, symptoms of the herbicide may not be visible on the top of the plant when sugars are moving very quickly to the roots, but the control of the targeted roots will be high.

In order to minimize weed seed production, producers often want to address perennial weeds earlier than the late summer when rootward sugar flow occurs. Removing top growth by mowing or shallow tillage while perennial plants are in the reproductive phase (upward sugar movement) can force them to draw on root reserves to continue the reproductive phase. This exhausts root reserves even further and continues to weaken the plant, while setting it up for the later herbicide application and preventing seed production. The added benefit to mowing under this year's wet conditions is that the remaining plant material also continues to take up water out of the soil.

There are many effective products for controlling perennial weeds in fallow that can be found in the *2010 Guide to Crop Protection* and Spring Update at www.agriculture.gov.sk.ca/Guide_to_Crop_Protection. When selecting an appropriate herbicide, ensure that it is registered for control of the target weed and is largely systemic. Contact herbicides are instantly visually satisfying when mixed with systemic herbicides, but they often trap the systemic herbicide in the leaf and reduce its effectiveness on the perennial root. ⚙

Bertha Armyworm Monitoring Program

By Sean Miller, PAg, Integrated Pest Management Agrologist

The 2010 Bertha Armyworm Monitoring Program continues to receive data from co-operators throughout July and will be completed in early August. The cool temperatures in May and June delayed the emergence of the adult bertha armyworm moths from their over-wintering pupal stage. Few adult moths were reported prior to the last week in June this year.

The Bertha Armyworm Risk Map is posted on the Saskatchewan Ministry of Agriculture website at www.agriculture.gov.sk.ca/maps_section. The map will be revised weekly until early August when traps are removed from fields. Mid-July captures suggest there are potentially moderate risk areas in the RMs 301, 331, 371 and 458. The high trap counts in RM 301 and 331 also coincide with high trap counts being reported in Benito, MB, directly across the border.

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Bertha Armyworm Monitoring Program (Continued from page 7)

Weekly moth numbers have peaked and are starting to decline in many areas, indicating the completion of the adult moth stage. The risk map (Figure 5) indicates some higher numbers in some areas and lower levels within close proximity, emphasizing the importance of individual field scouting.

The most accurate method of assessing populations of the destructive larvae is through individual field monitoring. This should begin in late July and continue until the number of larvae exceeds economic thresholds and the crop is sprayed, or until the crop is swathed. Bertha armyworm thresholds can vary based on the expected price of canola and the cost of insect control (insecticide and application cost). Using the current crop value and the insecticide application costs, Table 2 indicates the number of larvae per square metre at which an insecticide treatment in canola is warranted. Remember to check the pre-harvest interval for the insecticide being applied. ⚙



Figure 5: July 14, 2010 Bertha Armyworm Risk Map.
Source: Saskatchewan Agriculture.

Table 2: Economic thresholds for bertha armyworm on Argentine canola

Cost of Spraying (\$/acre)	Expected Value of Canola to Grower (\$ per bushel)										
	6	7	8	9	10	11	12	13	14	15	16
	# of larvae / square metre ²										
6	17	15	13	11	11	10	9	8	7	7	6
7	20	17	15	13	12	11	10	9	9	8	8
8	23	20	17	15	14	13	12	10	10	9	9
9	26	22	19	17	16	14	13	12	11	10	10
10	29	25	22	19	17	16	15	13	12	11	11
11	32	27	24	21	19	17	16	14	13	13	12
12	34	30	26	23	21	19	17	16	15	14	13

Insect Update

By Scott Hartley, PAg, Provincial Specialist, Insect and Vertebrate Pests

Wheat Midge

Wheat midge emergence is best estimated by the accumulation of heat measured in units of "degree days". Although most of the province should be experiencing some level of midge emergence, there will be variability in an area due to differences in precipitation and soil moisture. Moist conditions have a cooling effect, delaying midge development, whereas soil will warm quicker under dry conditions, accelerating midge development.

The bio-climatic model used to estimate wheat midge emergence indicates the highest levels (> 90 per cent midge emerged) are in the southeastern, east-central and south-central regions. The model indicates that most other areas are estimated to be at about 50 per cent emergence. Of course, with wheat crops in various stages it is important to consider the susceptible stage during which the plants are vulnerable to wheat midge. It is crucial to monitor crops from the time when the boot splits and any part of the head is visible, until anthesis (flowering) and the yellow anthers are extruded.

There have been some reports of insecticide application for wheat midge east of Saskatoon and in the Prince Albert area. With the delayed crop development, timing of fungicide application for fusarium and wheat midge control may coincide with tank mixing being more viable this year.

Grasshoppers

Wet, cool conditions delayed the grasshopper hatch in 2010. Cool spring temperatures also resulted in slower development. Although barely noticeable in June and early July, grasshopper populations are being closely monitored, particularly in lentil crops where only two grasshoppers per square metre may be sufficient to warrant insecticide control. With lush vegetation, crops can tolerate considerable grasshopper feeding but crops could be at greater risk if grasshoppers are actively feeding on yield components such as wheat heads, canola pods and flax bolls. If grasshopper populations are economically damaging at later crop stages, it will be important to consider pre-harvest intervals when making insecticide choices for control.

Root maggots

The wet conditions across the province are favourable to moisture-loving cabbage root maggots. There have been several reports of root maggots in canola varying from low levels - less than one maggot per stem on average - to five or six per stem on average across a field. There are no chemical control options for root maggots. Increased seeding rates for canola in the spring or a rotation to a non-susceptible crop are the only management alternatives for root maggots.

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Insect Update (Continued from page 9)

Diamondback moth

Pheromone traps picked up adult diamondback moths throughout most of the province in May and June, with the highest numbers occurring in southern regions. There have been sporadic reports of the insect across the province, but generally at low, non-economic levels. In the past week, there have been a couple of reports of many of the lace-like diamondback moth pupae indicating presence of the pest and the potential for risk from higher populations expected in the next few weeks. The diamondback moth may not be a factor if the canola is at an advanced stage. ⚙

Pesticide Safety and Field Re-entry

By Scott Hartley, PAg, Provincial Specialist, Insect and Vertebrate Pest

Application of pesticides (herbicides, fungicides, insecticides) is a normal part of many agricultural systems during the growing season. Field scouting and monitoring, to evaluate crops and crop pests, are also common during this time. There are other reasons for workers to enter fields where pesticide applications have occurred: insect and disease field surveys and gas, electrical and oilfield maintenance, for example.

It is important to consider re-entry periods associated with pesticides. Toxicity levels vary among chemicals, and the product label will generally provide specific information on restrictions, including the period of time to elapse after pesticide application before re-entering the field.

In July and August, insect pests such as wheat midge, grasshoppers, diamondback moths and bertha armyworms could require an insecticide application. Insecticides can be more toxic to humans than other pesticides. For many insecticides, the mode of action (e.g. chlorpyrifos for wheat midge) is through cholinesterase inhibition. Cholinesterase is an important enzyme required for the proper function of animal, including human, nervous systems.

Re-entry periods generally range from one hour to 48 hours after pesticide application. Always refer to the product label. Health Canada's Pest Management Regulatory Agency (PMRA) has a label search function on their website (pr-rp.pmra-arla.gc.ca/portal/page?_pageid=34,17551&_dad=portal&_schema=PORTAL). If a re-entry period is not specified or unavailable, a 48-hour waiting period is recommended. If it is necessary to enter an area within the prescribed re-entry period, it is essential to wear personal protective equipment (PPE) as identified on the label. PPE includes proper eye, respiratory and skin protection.

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Pesticide Safety and Field Re-entry
(Continued from page 10)

It may not always be possible to determine whether a pesticide has been applied in a field, so proceed with caution. Although wheel tracks are an obvious indication of ground application, the marks may not be visible from the roadside. Aerial application is a possibility when wheat midge are emerging or bertha armyworms are actively consuming canola, and it leaves no signs.

The *Guide to Crop Protection 2010* (pages 9 to 15) provides information on the safe use, handling and disposal of pesticides, proper protective clothing and safety. In case of emergencies, Saskatchewan Health has a Poison Control Centre (toll free at 1-866-454-1212). The University of Saskatchewan Toxicology Centre can be reached at 306-366-7441. ☼

The *Crop Production News* is a publication of the
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